

<b>US Department of Commerce Patent and Trademark Office</b>  <b>Form PTO-1449 (Modified)</b>		<b>Atty. Docket No.:</b> 42P16768		<b>Application No.:</b> <del>10/609443</del> <b>10/609443</b>		
		<b>Applicant:</b> Hok-Kin Choi, et al.				
		<b>Filing Date:</b> Concurrently Herewith <b>6-26-03</b>				
<b>US Patent Documents</b>						
Examiner's Initials	Date	Document Number	Name	Class	Sub- Class	Filing Date
<i>[Signature]</i>	03/04/86	4,574,094	DeLuca et al.	205	126	05/21/84
<i>[Signature]</i>	03/04/86	4,574,095	Baum et al.	427	584	09/19/84
<i>[Signature]</i>	12/06/88	4,789,648	Chow et al.	438	633	10/28/85
<i>[Signature]</i>	01/16/90	4,894,260	Kumasaka et al.	427	241	09/19/88
<i>[Signature]</i>	01/15/91	4,985,750	Hoshino	257	751	09/17/87
<i>[Signature]</i>	09/29/92	5,151,168	Gilton, et al.	205	123	09/24/90
<i>[Signature]</i>	08/31/93	5,240,497	Shacham et al.	106	1.26	10/08/91
<i>[Signature]</i>	03/18/97	5,612,254	Mu et al.	438	634	06/29/92
<i>[Signature]</i>	12/09/97	5,695,810	Dubin et al.	427	96	11/20/96
<i>[Signature]</i>	04/14/98	5,739,579	Chiang et al.	257	635	09/10/96
<i>[Signature]</i>	04/06/99	5,891,513	Dubin et al.	438	633	01/16/96
<i>[Signature]</i>	11/28/00	6,153,935	Edelstein et al.	257	773	09/30/99
<i>[Signature]</i>	01/02/01	6,169,024 B1	Hussein	438	627	09/30/98
<i>[Signature]</i>	01/06/01	6,174,812	Hsiung et al.	438	687	06/08/99
<i>[Signature]</i>	03/06/01	6,197,688	Simpson	438	678	02/12/98
<i>[Signature]</i>	07/10/01	6,258,707 B1	Uzoh	438	618	01/07/99
<i>[Signature]</i>	10/18/01	2,001,030,366	Nakano et al.	257	753	03/07/01
<i>[Signature]</i>	11/13/01	6,316,359 B1	Simpson	438	678	02/04/00
<i>[Signature]</i>	02/26/02	6,350,687 B1	Avazino et al.	438	687	03/18/99
<i>[Signature]</i>	03/19/02	6,358,832 B1	Edelstein et al.	438	612	08/18/00
<b>Foreign Patent Documents</b>						
Examiner's Initials	Date	Document Number	Country	Class	Sub- Class	Translation
<i>[Signature]</i>	11/25/87	62-270778	Japan	—	—	Yes
<i>[Signature]</i>	07/26/00	11-288940	Japan	—	—	Yes
<b>Other Documents (Including Author, Title, Date, Pertinent Pages, etc.)</b>						
<b>Examiner</b> <i>Helene Korman</i>			<b>Date Considered</b> 1-12-05			


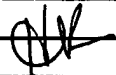
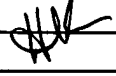
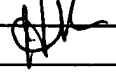
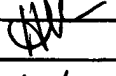
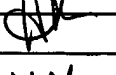
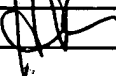
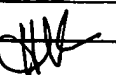
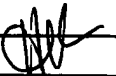

Examiner: Initial if reference is considered, whether or not citation is in conformance with MPEP 609; Draw a line through the citation if not in conformance and not considered. Include a copy of this form with the next communication to the applicant

<b>US Department of Commerce Patent and Trademark Office</b>  <b>Form PTO-1449 (Modified)</b>		Atty. Docket No.: 42P16768		Application No.: ***** 10/609443		
		Applicant: Hok-Kin Choi, et al.				
		Filing Date: Concurrently Herewith 6-26-03				
<b>US Patent Documents</b>						
Examiner's Initials	Date	Document Number	Name	Class	Sub- Class	Filing Date
[Signature]	12/08/92	5,169,680	Ting et al.	438	629	
[Signature]	02/02/93	5,183,795	Ting et al.	438	618	
[Signature]	10/20/98	5,824,599	Shacham-Diamand et al.	438	678	
[Signature]	11/03/98	5,830,805	Shacham-Diamand et al.	438	678	
[Signature]	04/11/00	6,048,445	Brain	205	118	
[Signature]	03/19/02	6,359,328	Dubin	257	622	
<b>Foreign Patent Documents</b>						
Examiner's Initials	Date	Document Number	Country	Class	Sub- Class	Translation
<b>Other Documents (Including Author, Title, Date, Pertinent Pages, etc.)</b>						
Examiner	[Signature: Helene Klemans]		Date Considered 1-12-05			

Examiner: Initial if reference is considered, whether or not citation is in conformance with MPEP 609; Draw a line through the citation if not in conformance and not considered. Include a copy of this form with the next communication to the applicant

<b>US Department of Commerce Patent and Trademark Office</b>  <b>Form PTO-1449 (Modified)</b>		<b>Atty. Docket No.:</b> 42P16768		<b>Application No.:</b> <del>****2443</del> 10/022443		
		<b>Applicant:</b> Hok-Kin Choi, et al.				
		<b>Filing Date:</b> <del>Concurrently Herewith</del> 6-26-03				
<b>US Patent Documents</b>						
Examiner's Initials	Date	Document Number	Name	Class	Sub- Class	Filing Date
<b>Foreign Patent Documents</b>						
Examiner's Initials	Date	Document Number	Country	Class	Sub- Class	Translation
<b>Other Documents (Including Author, Title, Date, Pertinent Pages, etc.)</b>						
JLK		"Thick Selective Electroless-Plated Cobalt-Nickel Alloy Contacts to CoSi <sub>2</sub> "; G.E. Georgiou, F. et al. J. Electrochem. Soc., Vol. 138, No. 7, July 1991, pgs. 2061-2069. © The Electrochemical Society, Inc.				
JLK		"Encapsulated Copper Interconnection Devices Using Sidewalls Barriers", Donald S. Gardner et al.; VMIC Conference; June 11-12, 1991, pgs. 99-108.				
JLK		"Planar Copper-Polyimide Back End of the Line Interconnections for ULSI Devices"; B. Luther et al. VMIC Conference; June 8-9, 1993, pgs. 15-21.				
JLK		"Electroless plating of copper at a low pH level", R. Jagannathan et al.; IBM J. Res. Develop. Vol. 37, No. 2: March 1993, pgs. 117-123.				
JLK		"Selective Electroless Metal Deposition for Integrated Circuit Fabrication", Chiu H. Ting et al.; J. Electrochem Soc. Vol. 136, No. 2; Feb. 1989, pgs. 456-461. The Electrochemical Society, Inc.				
JLK		"Selective Electroless Metal Deposition for Via Hole Filling in VLSI Multilevel Interconnection Structures"; Chiu H. Ting et al.; J. Electrochem Soc. Vol. 136, No. 2; Feb. 1989, pgs. 462-465. © The Electrochemical Society, Inc.				
JLK		"Pd/Si plasma immersion ion implantation for selective electroless copper plating on SiO <sub>2</sub> "; Kiang et al.; Applied Phys. Lett. 60 (22): June 1, 1992, pgs. 2767-2769. The American Institute of Physics.				
JLK		"Selective electroless Ni deposition on a TiW underlayer for integrated circuit fabrication"; V.M. Dubin et al.; Thin Solid Films, 226 (1993), pgs. 87-93, no month.				
JLK		"Copper Corrosion With and Without Inhibitors"; V. Brusic et al.; J. Electrochem. Soc. Vol. 138, No. 8, August 1991, pgs. 2253-2259. © The Electrochemical Society, Inc.				
<b>Examiner</b> <i>Helene Korman</i>			<b>Date Considered</b> 1-12-05			

Examiner: Initial if reference is considered, whether or not citation is in conformance with MPEP 609; Draw a line through the citation if not in conformance and not considered. Include a copy of this form with the next communication to the applicant

<b>US Department of Commerce Patent and Trademark Office</b>  <b>Form PTO-1449 (Modified)</b>		<b>Atty. Docket No.:</b> 42P16768		<b>Application No.:</b> * <del>10/609443</del>		
		<b>Applicant:</b> Hok-Kin Choi, et al.				
		<b>Filing Date:</b> <del>Concurrently Herewith</del> 6-26-03				
<b>US Patent Documents</b>						
<b>Examiner's Initials</b>	<b>Date</b>	<b>Document Number</b>	<b>Name</b>	<b>Class</b>	<b>Sub- Class</b>	<b>Filing Date</b>
<b>Foreign Patent Documents</b>						
<b>Examiner's Initials</b>	<b>Date</b>	<b>Document Number</b>	<b>Country</b>	<b>Class</b>	<b>Sub- Class</b>	<b>Translation</b>
	11/15/2001	PCT/US 01/44791	PCT Search Report	—	—	
<b>Other Documents (Including Author, Title, Date, Pertinent Pages, etc.)</b>						
		"100 nm wide copper lines made by selective electroless deposition"; Yosi Shacham-Diamand; J. Micromech. Microeng. 1 (1991). pgs.66-732, <i>no month</i> .				
		"A Half-Micron Pitch Cu Interconnection Technology"; Kazuyoshi Ueno et al.; 1995 Symposium on VSLI Technology Digest of Technical Papers. pgs. 27-28, <i>no month</i> .				
		"Electroless Metal Deposition From Aqueous Solutions", V.V. Sviridov; Minsk Bielorrussion State University; 1987. pgs. 60-85, <i>no month</i> .				
		"Passivation of Copper by Silicide Formation In Dilute Silane", S. Hymes, et al. Conf. Proc. USLI-VII, Materials Research Society ; 1992, pgs. 425-431, <i>no month</i> .				
		"Copper Interconnection with Tungsten Cladding for ULSI"; J.S.H. Cho et al.; ULSI Tech. Symp; 1991; pp. 39-40, <i>no month</i> .				
		C.J. Sambucetti et al. "Electroless Deposition of Thin Alloy Layers for Metal Passivation and Solder Barriers. August 31, 1997, Electromechanical Society Proceedings, vol. 97-27, pages 336-345, XP001058382.				
		S.D. Lopatin et al., "Thin Electroless Barrier for Copper Films", Proceedings of the SPIE, SPIE Bellingham, VA, Vol. 3508, 9/23/1998, pages 65-77, XP001058166.				
		H. Honma and M. Noguchi, "Electroless Cobalt Bath-Life Extension" December 1990. Pages 67 - 70.				
<b>Examiner</b>		<b>Date Considered</b>				
		1-12-05				

Examiner: Initial if reference is considered, whether or not citation is in conformance with MPEP 609; Draw a line through the citation if not in conformance and not considered. Include a copy of this form with the next communication to the applicant

<b>US Department of Commerce</b> <b>Patent and Trademark Office</b>  <b>Form PTO-1449 (Modified)</b>		<b>Atty. Docket No.:</b> 42P16768		<b>Application No.:</b> ***10/609443***			
		<b>Applicant:</b> Hok-Kin Choi, et al.					
		<b>Filing Date:</b> Concurrently Herewith 6-26-03					
<b>US Patent Documents</b>							
<b>Examiner's Initials</b>		<b>Date</b>	<b>Document Number</b>	<b>Name</b>	<b>Class</b>	<b>Sub-Class</b>	<b>Filing Date</b>
<b>Foreign Patent Documents</b>							
<b>Examiner's Initials</b>		<b>Date</b>	<b>Document Number</b>	<b>Country</b>	<b>Class</b>	<b>Sub-Class</b>	<b>Translation</b>
		7/26/2000	EP 1022770A2	European	—	—	
		07/26/00	EP 1022770A3	European	—	—	
<b>Other Documents (Including Author, Title, Date, Pertinent Pages, etc.)</b>							
		"Electroless Cu for VLSI"; James S.H. Cho et al.; MRS Bulletin/ June 1993, pgs. 31-38.					
		"Electroless Copper Deposition on Metals and Metal Silicides"; Cecilia Y. Mak; MRS Bulletin/August 1994, pgs. 55-62.					
		"Selective and Blanket Electroless Cu Plating Initiated By Contact Displacement For Deep Submicron Via Contact Filling"; Dubin et al.; VMIC Conf.; June 27-29, 1995, pgs. 315-321.					
		"Q35 um Cu-Filled Via Holes By Blanket Deposited Electroless Copper On Sputtered Seed Layer"; Yosi Shacham-Diamond et al.; VMIC Conf. ; June 27-29, 1995, pgs. 334-336.					
		"Barriers Against Copper Diffusion into Silicon and Drift Through Silicon Dioxide"; Shi-Qing Wang; MRS Bulletin/August 1994, pgs. 30-40.					
		"Inlaid Copper Multilevel Interconnections Using Planarization by Chemical-Mechanical Polishing"; S.P. Murarka et al.; MRS Bulletin/June 1993, pgs. 46-51.					
		"Electrochemically Deposited Diffusion Barriers"; M. Paunovic; et al. J. Electrochem, Soc., Vol. 141, No.7; July 1994, pgs. 1843-1850. © The Electrochemical Society, Inc.					
		"Electroless Copper Deposition For Multilevel Metallization"; S.Simon Wong et al.; Mat. Res. Soc. Symp. Proc. Vol. 203; 1991 Materials Research Society, pgs. 347-356. no month.					
<b>Examiner</b> Helene Klemans				<b>Date Considered</b> 1-12-05			

Examiner: Initial if reference is considered, whether or not citation is in conformance with MPEP 609; Draw a line through the citation if not in conformance and not considered. Include a copy of this form with the next communication to the applicant



Substitute for form 1449A/PTO <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>				<b>Complete if Known</b>	
				Application Number	10/609,443
Sheet 1 of 1				Filing Date	June 26, 2003
				First Named Inventor	Hok-Kin Choi
				Art Unit	<del>Not yet assigned</del> 1755
				Examiner Name	<del>Not yet assigned</del> Klemanski
				Attorney Docket Number	42P16768

OTHER ART - NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.†	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T*
SK		Watanabe and Honman, "Direct Electroless Nickel Plating on Copper Circuits Using DMAB as a Second Reducing Agent" IEMT/IMC Proceedings; pgs 149- 153 (1998), no month.	
SK		T. Osaka et al., "Preparation of CoB Soft Magnetic Thin Films by Electroless Plating" IEEE Translation Journal on Magnetism in JAPAN, Vol. 6, No. 1, January 1991. Pgs 85 -90.	
SK		V.M. Dubin, "Selective electroless Ni deposition onto Pd-activated Si for integrated circuit fabrication", Thin Solid Films, 226 (1993) pgs 94-98, no month.	

Examiner Signature	<i>Helene Klemanski</i>	Date Considered	1-12-05
--------------------	-------------------------	-----------------	---------

\*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

†Applicant's unique citation designation number. \*Applicant is to place a check mark here if English language Translation is attached.

Based on PTO/SB/08B (08-03) as modified by Blakely, Solokoff, Taylor & Zalman (w/r) 08/11/2003.  
Send To: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450